

## PATENT COOPERATION TREATY

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## NOTIFICATION OF ELECTION

(PCT Rule 61.2)

From the INTERNATIONAL BUREAU

To:

Assistant Commissioner for Patents  
United States Patent and Trademark  
Office  
Box PCT  
Washington, D.C. 20231  
ETATS-UNIS D'AMERIQUE

in its capacity as elected Office

<b>Date of mailing (day/month/year)</b> 03 April 2000 (03.04.00)	
<b>International application No.</b> PCT/NO99/00244	<b>Applicant's or agent's file reference</b> P9859
<b>International filing date (day/month/year)</b> 28 July 1999 (28.07.99)	<b>Priority date (day/month/year)</b> 14 August 1998 (14.08.98)
<b>Applicant</b> SELMER-OLSEN, Ingvar et al	

1. The designated Office is hereby notified of its election made:

☒ in the demand filed with the International Preliminary Examining Authority on:

29 February 2000 (29.02.00)

☐ in a notice effecting later election filed with the International Bureau on:2. The election ☒ was☐ was not

made before the expiration of 19 months from the priority date or, where Rule 32 applies, within the time limit under Rule 32.2(b).

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

Authorized officer

Nestor Santesso

Facsimile No.: (41-22) 740.14.35

Telephone No.: (41-22) 338.83.38

## PATENT COOPERATION TREATY

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NOTIFICATION CONCERNING  
SUBMISSION OR TRANSMITTAL  
OF PRIORITY DOCUMENT

(PCT Administrative Instructions, Section 411)

From the INTERNATIONAL BUREAU

To:

SUNDNES, Arne  
Norsk Hydro ASA  
N-0240 Oslo  
NORVÈGE

Date of mailing (day/month/year) 11 October 1999 (11.10.99)	IMPORTANT NOTIFICATION
Applicant's or agent's file reference P9859	
International application No. PCT/NO99/00244	International filing date (day/month/year) 28 July 1999 (28.07.99)
International publication date (day/month/year) Not yet published	Priority date (day/month/year) 14 August 1998 (14.08.98)
Applicant NORSK HYDRO ASA et al	

1. The applicant is hereby notified of the date of receipt (except where the letters "NR" appear in the right-hand column) by the International Bureau of the priority document(s) relating to the earlier application(s) indicated below. Unless otherwise indicated by an asterisk appearing next to a date of receipt, or by the letters "NR", in the right-hand column, the priority document concerned was submitted or transmitted to the International Bureau in compliance with Rule 17.1(a) or (b).
2. This updates and replaces any previously issued notification concerning submission or transmittal of priority documents.
3. An asterisk(\*) appearing next to a date of receipt, in the right-hand column, denotes a priority document submitted or transmitted to the International Bureau but not in compliance with Rule 17.1(a) or (b). In such a case, **the attention of the applicant is directed to Rule 17.1(c)** which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.
4. The letters "NR" appearing in the right-hand column denote a priority document which was not received by the International Bureau or which the applicant did not request the receiving Office to prepare and transmit to the International Bureau, as provided by Rule 17.1(a) or (b), respectively. In such a case, **the attention of the applicant is directed to Rule 17.1(c)** which provides that no designated Office may disregard the priority claim concerned before giving the applicant an opportunity, upon entry into the national phase, to furnish the priority document within a time limit which is reasonable under the circumstances.

<u>Priority date</u>	<u>Priority application No.</u>	<u>Country or regional Office or PCT receiving Office</u>	<u>Date of receipt of priority document</u>
14 Augu 1998 (14.08.98)	19983729	NO	28 Sept 1999 (28.09.99)

The International Bureau of WIPO  
34, chemin des Colombett s  
1211 Gen va 20, Switz rland

Facsimile No. (41-22) 740.14.35

Authorized officer

Beatriz Morariu

Telephone No. (41-22) 338.83.38

06 MAR 2000

P9859 PCT

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From the INTERNATIONAL BUREAU

NOTICE INFORMING THE APPLICANT OF THE  
COMMUNICATION OF THE INTERNATIONAL  
APPLICATION TO THE DESIGNATED OFFICES

(PCT Rule 47.1(c), first sentence)

To:

SUNDNES, Arne  
Norsk Hydro ASA  
N-0240 Oslo  
NORVÈGE

Date of mailing (day/month/year)

24 February 2000 (24.02.00)

Applicant's or agent's file reference

P9859

## IMPORTANT NOTICE

International application No.

PCT/NO99/00244

International filing date (day/month/year)

28 July 1999 (28.07.99)

Priority date (day/month/year)

14 August 1998 (14.08.98)

Applicant

NORSK HYDRO ASA et al

1. Notice is hereby given that the International Bureau has communicated, as provided in Article 20, the international application to the following designated Offices on the date indicated above as the date of mailing of this Notice:

AU,CN,EP,IL,JP,KP,KR,US

In accordance with Rule 47.1(c), third sentence, those Offices will accept the present Notice as conclusive evidence that the communication of the international application has duly taken place on the date of mailing indicated above and no copy of the international application is required to be furnished by the applicant to the designated Office(s).

2. The following designated Offices have waived the requirement for such a communication at this time:

AE,AL,AM,AP,AT,AZ,BA,BB,BG,BR,BY,CA,CH,CU,CZ,DE,DK,EA,EE,ES,FI,GB,GD,GE,GH,GM,HR,  
HU,ID,IN,IS,KE,KG,KZ,LC,LK,LR,LS,LT,LU,LV,MD,MG,MK,MN,MW,MX,NO,NZ,OA,PL,PT,RO,RU,  
SD,SE,SG,SI,SK,SL,TJ,TM,TR,TT,UA,UG,UZ,VN,YU,ZA,ZW

The communication will be made to those Offices only upon their request. Furthermore, those Offices do not require the applicant to furnish a copy of the international application (Rule 49.1(a-bis)).

3. Enclosed with this Notice is a copy of the international application as published by the International Bureau on 24 February 2000 (24.02.00) under No. WO 00/08929

## REMINDER REGARDING CHAPTER II (Article 31(2)(a) and Rule 54.2)

If the applicant wishes to postpone entry into the national phase until 30 months (or later in some Offices) from the priority date, a demand for international preliminary examination must be filed with the competent International Preliminary Examining Authority before the expiration of 19 months from the priority date.

It is the applicant's sole responsibility to monitor the 19-month time limit.

Note that only an applicant who is a national or resident of a PCT Contracting State which is bound by Chapter II has the right to file a demand for international preliminary examination.

## REMINDER REGARDING ENTRY INTO THE NATIONAL PHASE (Article 22 or 39(1))

If the applicant wishes to proceed with the international application in the national phase, he must, within 20 months or 30 months, or later in some Offices, perform the acts referred to therein before each designated or elected Office.

For further important information on the time limits and acts to be performed for entering the national phase, see the Annex to Form PCT/IB/301 (Notification of Receipt of Record Copy) and Volume II of the PCT Applicant's Guide.

The International Bureau of WIPO  
34, chemin des Colombettes  
1211 Geneva 20, Switzerland

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Authorized officer

J. Zahra

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# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY EXAMINATION REPORT



(PCT Article 36 and Rule 70)

Applicant's or agent's file reference <b>P9859</b>	<b>FOR FURTHER ACTION</b> See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. <b>PCT/NO99/00244</b>	International filing date (day/month/year) <b>28/07/1999</b>	Priority date (day/month/year) <b>14/08/1998</b>
International Patent Classification (IPC) or national classification and IPC <b>A01N37/02</b>		
Applicant <b>NORSK HYDRO ASA et al.</b>		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.  
  
☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).  
  
 These annexes consist of a total of 1 sheets.

3. This report contains indications relating to the following items:

- I ☒ Basis of the report
- II ☐ Priority
- III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- IV ☐ Lack of unity of invention
- V ☒ Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- VI ☒ Certain documents cited
- VII ☐ Certain defects in the international application
- VIII ☒ Certain observations on the international application

Date of submission of the demand <b>29/02/2000</b>	Date of completion of this report <b>24.10.2000</b>
Name and mailing address of the International preliminary examining authority:   European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 pmu d Fax: +49 89 2399 - 4465	Authorized officer  <b>Mitchell, G</b>  Telephone No. +49 89 2399 8678  

# INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/NO99/00244

## I. Basis of the report

1. This report has been drawn on the basis of *(substitute sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to the report since they do not contain amendments (Rules 70.16 and 70.17).)*

Description, pages:

1-8 as originally filed

Claims, No.:

1-5 as received on 12/08/2000 with letter of 08/08/2000

Drawings, sheets:

1/2,2/2 as originally filed

2. With regard to the language, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- ☐ the language of publication of the international application (under Rule 48.3(b)).
- ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
- ☐ filed together with the international application in computer readable form.
- ☐ furnished subsequently to this Authority in written form.
- ☐ furnished subsequently to this Authority in computer readable form.
- ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
- ☐ the claims, Nos.:

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT**

International application No. PCT/NO99/00244

☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)):

*(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)*

6. Additional observations, if necessary:

**V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes:	Claims	1-5
	No:	Claims	
Inventive step (IS)	Yes:	Claims	1-5
	No:	Claims	
Industrial applicability (IA)	Yes:	Claims	1-5
	No:	Claims	

2. Citations and explanations  
see separate sheet

**VI. Certain documents cited**

1. Certain published documents (Rule 70.10)

and / or

2. Non-written disclosures (Rule 70.9)

see separate sheet

**VIII. Certain observations on the international application**

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

s separate sheet

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/NO99/00244

**Re Item I**

**Basis of the report**

This report is based on the amendments filed on 12.08.2000 which are in accordance with Art. 34 (2) (b) PCT.

**Re Item V**

**Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

The subject-matter of claims 1-5 appears to be both new and inventive in the sense of Art. 33 (1), (2) and (3) PCT.

The combination of ammonium tetraformate (ATF) and 0.5-5 wt% glycerol in an aqueous preservative is not disclosed in the prior art. (See Item VIII regarding "any other combination of formic acid and ammonia").

The documents cited on the International Search Report are either P- (see Item VI) or A-documents. The A-documents relate to the general state of the art but do not disclose any information which would destroy the novelty of the present application.

The technical problem of the present application is the provision of an ATF containing preservative being less corrosive and irritating to skin.

The technical problem is solved by the addition of glycerol to an aqueous preservative which contains ATF. The applicant states that the technical effect is surprising because the addition of glycerol results in the ATF-containing preservatives safety classification being changed from "corrosive to skin" to "irritating to skin" (page 3, line 21-24) as defined in the Official Journal of the European Communities (see reference in description, page 3, line 6-7). Table 1 of the present application supports the assertion of an improvement over the art wherein, a comparison is made between an ATF containing preservative and preservatives containing glycerol in different amounts. The comparative data demonstrates an improvement in the skin compatibility of ATF when used with glycerol. Therefore, an inventive step can be acknowledged.

**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

International application No. PCT/NO99/00244

**Re Item VI**

**Certain documents cited**

**Certain published documents (Rule 70.10)**

Application No Patent No	Publication date (day/month/year)	Filing date (day/month/year)	Priority date (valid claim) (day/month/year)
WO 99/12435 (D1)	18.03.1999	11.09.1998	11.09.1997
WO 99/00023 (D2)	07.01.1999	18.06.1998	18.06.1997

The filing date of D1 falls after the priority date (14.08.1998) but before the filing date (28.07.1999) of the present application and the filing date of D2 falls before both the priority date and the filing date of the present application.

Since the priority document is not presently available, the priority is assumed to be valid and therefore, D1 and D2 shall not be taken into consideration for novelty, inventive step and industrial applicability assessment, at the moment. If, however, at the regional phase of examination, the priority is found to be invalid D1 and D2, in particular D2, may be used for novelty assessment for the parts of the application for which priority is not valid.

**Re Item VIII**

**Certain observations on the international application**

There is no support for the aqueous preservative which contains "any other combination of formic acid and ammonia" and comprises 0.5-5 wt% glycerol in the description (Art. 6 PCT). The application concentrates on the use of ammonium tetraformate (ATF) in a composition, as pointed out by the Applicant on page 3, line 12-13. In fact, the technical problem solved by the present application is the provision of a ATF containing preservative being less corrosive and irritating to skin (page 3, line 20-26) by introducing glycerol to the preservative. The phrase "any other combination of formic acid and ammonia" is vague (Art. 6 PCT) and renders claim 1 unclear, as the products of the reaction between ammonium and formic acid are not clearly defined in either the description or the claims. The broadness of claim 1 is therefore, not



**INTERNATIONAL PRELIMINARY  
EXAMINATION REPORT - SEPARATE SHEET**

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International application No. PCT/NO99/00244

considered to be supported by the description and the embodiments contained therein.  
The applicant must limit the claim to ATF.

M.H

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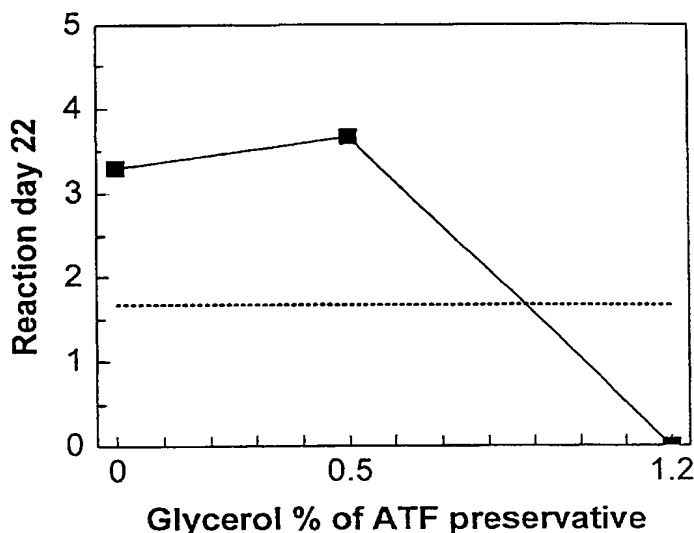
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## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification <sup>6</sup> : <b>A01N 37/02, 31/02, A23K 3/03, A23B 4/12, A23L 3/3517</b>		<b>A1</b>	(11) International Publication Number: <b>WO 00/08929</b>
			(43) International Publication Date: 24 February 2000 (24.02.00)
(21) International Application Number: PCT/NO99/00244 (22) International Filing Date: 28 July 1999 (28.07.99) (30) Priority Data: 19983729 14 August 1998 (14.08.98) NO (71) Applicant (for all designated States except US): NORSK HYDRO ASA [NO/NO]; N-0240 Oslo (NO). (72) Inventors; and (75) Inventors/Applicants (for US only): SELMER-OLSEN, Ingvar [NO/NO]; Sørliv. 27, N-1473 Skårer (NO). HJØRNEVIK, Leif [NO/NO]; St. Hansg. 3, N-3714 Skien (NO). JOHNSEN, Freddy [NO/NO]; Grenseveien 28, N-1927 Rånåsfoss (NO). (74) Agent: SUNDNES, Arne; Norsk Hydro ASA, N-0240 Oslo (NO).		(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.          Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>	

(54) Title: AQUEOUS PRESERVATIVE



Borderline non-  
corrosive preservative

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## (57) Abstract

The present invention relates to aqueous preservatives, containing ammonium tetraformate or any other combination of formic acid and ammonia, for grass and other agricultural crops, fish and fish products and meat products, having reduced corrosiveness and irritation to skin, comprising 0.5–5 weight% glycerol. Preferably the content of glycerol in the preservative is 0.75–1.5 weight%. The preservative may further contain at least one metal corrosion inhibitor and/or antioxidant.

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EE	Estonia						

## **Aqueous Preservative**

The present invention relates aqueous formic acid containing preservative for grass and other agricultural crops, fish and fish products and meat products, having reduced corrosiveness and irritation to skin.

Preserving high moisture grass as silage in anaerobic conditions has been common practice for many years. A fast drop in pH is important to inhibit plant respiration, enzymatic protein breakdown and development of undesired bacteria. The only desired process is the lactic acid fermentation, which stabilises the silage at low pH. The initial drop in pH from approximately 6 to about 4.5 is commonly obtained by adding formic acid at a rate of 2-5 litres/ton grass. Formic acid is the most widespread acid silage preservative mainly due to its efficient acidification and antimicrobial effect, according to J.M. Wilkinson et al. (1966) "Silage in Europe. A survey of 33 countries", Chalcombe Publications Ltd., Lincoln UK, and McDonald et al. (1991) "The Biochemistry of Silage", second Ed., Chalcombe Publications, Lincoln UK. Field surveys have shown that formic acid based silage additives have been the most efficient additive for high moisture grass (Nordang, L.Ø. "Surforundersøkelsen 1989-90", Faginfo, Statens fagtjeneste for landbruket, 6, 1991 and ADAS 1995, "Effect of additives on DM on fermentation", Grass Farmer, 57, 11). However, 85% formic acid has a high level of corrosion on skin and metal (machinery).

The principles of silage preservation of meat- and fish offals are basically the same as for grass. However, even more stress is put on an efficient acidifier to reduce the pH. This is because offal of animal origin contains very little sugar to produce lactic acid, and the buffering capacity is high.

Mixtures of formic acid and formate salts and also other organic acids (propionic acid and acetic acid and their respective salts) have been developed to reduce the corrosiveness of the acid product. The most successful formulation in terms of efficient preservation and success in major markets has been ammonium tetraformate, comprising about 64% formic acid, about 6% ammonia and the balance being water (EP-411.827B1). The plain ammonia tetraformate (ATF) has been better than standard formic acid (85%) in terms of corrosion and burns to skin according to P. Westgaard, Journal Buskap og Avdraat, Vol. 37, pp 246-247, 1985. But it is still desired to reduce these negative properties of this efficient preservative. The corrosion on carbon steel has recently been overcome by addition of corrosion inhibitors such as cocobetaine or polyglycoside described in Norwegian Patent Application No. 974200. The skin corrosion is, however, still considered subject to improvements as ATF-type preservatives in this respect have to be labelled with "Corrosion" sign and the risk phrase "Causes burns".

The problem is to reduce the skin corrosion and at the same time maintain the same acidifying effect and good effect on silage fermentation quality. Just increasing the pH of the preservative might solve the problem of skin corrosion, however, it would produce new problems such as a less efficient preservative.

Known additives for reduction of metal corrosion have not been found to substantially reduce skin corrosion. Addition to preservatives of large amounts of lignosulphonates are claimed to reduce skin corrosion, but this will dilute the preservative and require use of relatively high amounts of preservative to obtain desired effect.

In the patent application WO 96/24247 there is stated that the aim is to obtain a preservative containing formic acid that has reduced corrosiveness on the skin, metal and machinery. A composition is made containing at least one ester of an unsubstituted or substituted benzoic acid with a C<sub>1</sub>-C<sub>9</sub> alcohol or a mixture of such esters and another ester component of an unaromatic C<sub>1</sub>-C<sub>20</sub> carboxylic acid with a C<sub>1</sub>-C<sub>9</sub> alcohol. The preservative further contains at least one C<sub>1</sub>-C<sub>4</sub> carboxylic acid. The preservative may contain 1.5-3 weight% of the ester mixture. This composition is stated to have excellent preservative effect. Data are however not given for corrosiveness with regard to metal or skin.

The main objective of the present invention was to arrive at an improved formic acid containing preservative being less corrosive and irritating to skin .

Another objective was to arrive at a preservative which could be classified as non-corrosive after a four hour skin exposure and thereby bring this type of preservatives from class "Corrosive to skin" (§3.2.5) to "Irritating to skin" (§3.2.6) as defined in Official Journal of the European Communities L 110A, Vol 36, May 4th, 1993 ( Annex IV of Commission Directive 93/21EEC).

A further objective was to find a skin corrosion inhibitor which would be effective when applied in minor amounts and thereby avoid dilution or major change of the basic preservative.

In the search for a new solution to the skin corrosion problem related to preservatives it was first decided to concentrate on formic acid containing preservatives, primarily an ATF preservative. It was also essential to maintain the acidifying effect and good effect on silage fermentation quality. Accordingly, reduction of the acidity of the preservative was ruled out. Further checking on known metal anticorrosion agents revealed that their effect on the reduction on skin corrosion was only marginal. Both the corrosion inhibitor cocobetaine and the antioxidant ehtoxyquin were found to be insufficient with regard to reduction of skin corrosion. Thus the mode of action for inhibitors for metal corrosion seemed to be different from what was observed for skin corrosion. One inhibitor for steel corrosion which the inventors found useful to check further was glycerol which has been applied in some preservative in small amounts (0.5%). On skin, however, addition of glycerol to the ATF first seemed to have no effect, but when the amount added was substantially increased, it was surprisingly found that glycerol was able to bring ATF from class "Corrosive to skin" to class "Irritating to skin". The main reason for investigating the effect of glycerol was that it is approved as feed additive in the EU list of additives (E422). Glycerol is further a valuable nutrient for animals and a substitute for several metabolic pathways.

A comprehensive test program was then started to find the real effect of glycerol compared with other additives to preservatives. These tests proved that glycerol indeed gave a substantial reduction of skin corrosion of the preservative. The necessary amount for obtaining desired reduction in skin corrosion was found to depend on several factors such as the degree of neutralisation of the formic acid with ammonia. But already with addition of more than 0.5 weight% glycerol the skin corrosion started to go down. The upper limit for the glycerol content was found to be more a practical and economic limit in view of the fact that glycerol also is a nutrient. With regard to reduction of skin corrosion, however, it was found that for most cases 1.5 weight% would be sufficient.

Thus the preservative according to the invention contains ammonium tetraformate or any other combination of formic acid and ammonia and should contain 0.5-5 weight% glycerol.

Preferably the glycerol content in the preservative should be in the range 0.75-1.5 weight%.

The preservative may contain at least one metal corrosion inhibitor such as cocobetaine or alkyl glycoside. The preservative may also contain antioxidant.

The invention is further explained and elucidated in connection with the description of the figures and the examples.

Figure 1 shows the effect of glycerol in ATF on skin corrosion observed the first 24 hours after exposure.

Figure 2 shows the effect of glycerol in ATF on how the skin resolved 22 days after exposure. A borderline for the maximum skin effects allowed for a non-corrosive preservative is indicated by a dotted line.

**Example 1**

This example shows the effect of ATF preservatives with various additives on test animals (Rabbits) exposed for four hours to the preservative. The tests were performed in compliance with that described in Annex to Commission Directive 92/69/EEC, Method B4 and OECD Guidelines for Testing of Chemicals, Method 404 (Official Journal of the European Communities L 383A, Vol. 35, 29. Dec. 1992 ).

The animals were exposed to the samples on local areas of shaved skin for 4 hours. After that, skin reactions were recorded after 1 hour, 24 hours, 48 hours, 72 hours, 8 days, 15 days and 22 days. If there were severe burns to the skin with erosion and/or necrotic tissue, the animals were terminated very soon, and the degree of healing was not assessed. If the first animal showed severe signs of skin corrosion, further animals were not allowed to be exposed to the chemical. The animals who had milder reactions were kept until day 22. It is critical whether the test animals show a complete healing of the skin (regenerating skin with hair) or whether there are scars (permanent damage).

In order to present the skin reaction as a numerical parameter there were made a score for each observed effect. The mean value of the 3 (4) animals at an early stage (1-24 hours after exposure) was calculated for each sample. The degree of lasting skin damage was calculated from the readings at day 15-22 after exposure. If one animal out of three showed permanent damage (scar) at day 22 the product would be classified as corrosive. The lowest mean value (borderline) for a corrosive classification was therefore 1.7 (score 5 divided by 3 observations). The recorded results from the tests are shown in Table 1. In the two last columns the mean reaction scores are shown. Reactions and Reaction scores are defined below.



Table 1

Sample	pH	Animal	Time after completion of 4 hour exposure							Reaction score	
			1h	24h	48h	72h	Day 8	Day 15	Day 22	Early 1-24h	Day 22
ATF	2.67	36m 45m 46m	+ +# +#	+ cb ce	0 cb ce	0 cb ce	0 pe pe	0 es,ns es,ns	0 ns@ ns@,sc	3.3	3.3
ATF + 0.2% coco- betaine	2.67	37m 47m 48m 61f	0 # +# ce	0 cb ce term.	0 cb ce term.	0 cb ce term.	0 cb,pe ce,pe term.	0 sc3 ns term.	0 0 0 term.	3.5	1.8
ATF + 2% ethoxy- quin	2.67	40m 54m 55m	# wh,# wh,#	# cb term.	0 cb term.	0 cb term.	0 sc,cb,pe term.	0 sc2 term.	0 0 term.	3.5	1.8
ATF + 0.5% glycerol	2.65	142f 1522f 153f	# wh,# wh,#	# # #	# # #	# # #	es1 # #	ns@ sc sc	term. ns@1 ns@1	1.5	3.6
ATF + 1.2% glycerol	2.66	69f 100f 101f	cb3 #,wh 0	cb3 #,wh 0	nc3 #,wh 0	nc3 #,wh 0	nc3 sc,# 0	nc3 ns 0	0 0 0	1.8	0

## Definition of Reactions:

0	no sign
wh	blanching
ns	new skin revealed
sc	scabbing
ph	petechial haemorrhage
at	atonia
term.	rabbit was killed due to cb/cs
cba	blanched area showing signs of chemical burn
cb	chemical burn (no erosion)
ce	corrosion/chemical burn-and areas of site eroded
ns@	new skin with scar tissue (larger than 0.5 cm <sup>2</sup> )
ns@1	new skin with scar tissue in small local foci.
pe	peeling
+	blue coloration to test site
fs	fissuring
#	brown coloration to test site
es	eschar
nc	necrotic tissue

Number after code indicates number of affected areas of the site.

**Reaction Score (mean):**

A score is given for each observation based on the severity of the different reactions.

**Early reactions (1-24 hours after exposure)**

<b><u>Code</u></b>	<b><u>Reaction</u></b>	<b><u>Severity score</u></b>
0	no sign	0
wh	blanching	0.5
+	Blue coloration to test site	1.0
#	brown coloration	1.5
ph	petechial haemorrhage	1.5
cba	blanched area showing signs of chemical burn	3
cb	chemical burn (no erosion)	4
ce	corrosion/chemical burn-and areas of site eroded	5
term.	rabbit was killed due to severe corrosion	5

**Healing reactions (day 22 after exposure)**

<b><u>Code</u></b>	<b><u>Healing reaction</u></b>	<b><u>Severity score</u></b>
0/ns	intact skin and hair/new skin	0
sc	scabbing	2
es1	eschar, small local foci	3
ns@1	new skin with scar tissue in small local foci	3
es	eschar large area	5
ns@	new skin with scar tissue	5
term.	rabbit was killed due to lasting damage.	5

From Table 1 and the Figure 1 it can be seen that when at least 0.5 weight% of glycerol is added to the ATF preservative, the skin corrosion is substantially reduced. The addition of 0.5 weight% glycerol gave a significant reduction in the first skin reactions observed 1-24 hours after exposure. This amount of glycol was, however, too small to give a 100% protection of the dose site, and small local foci of scabbing and small local scars appeared on day 22.

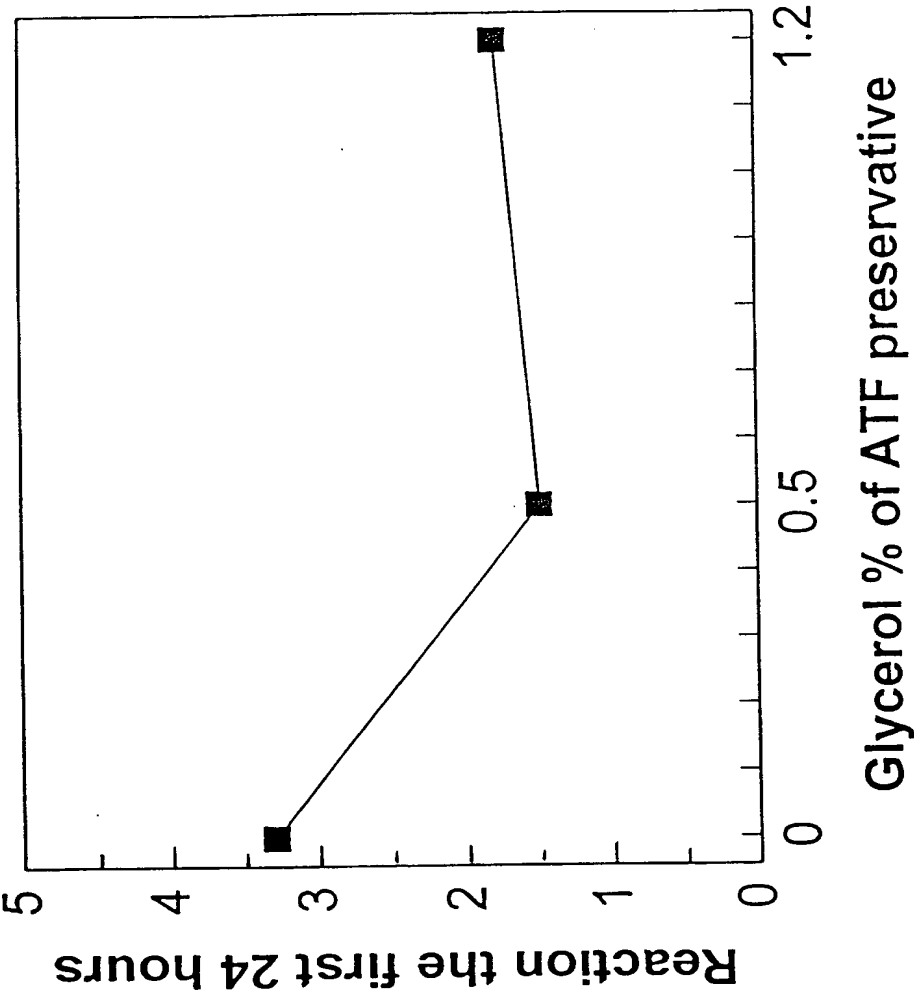
From Figure 2 it can be seen that a 1.2 weight% level of glycerol was enough to give full protection of the skin. Thus the new preservative can be classified as "Irritating to skin" contrary to the ATF without glycerol which is labelled "Corrosive to skin". It is further shown that when only 1.2 weight% glycerol is added, the severity score is well below that generally accepted (Borderline on Figure 2).

Claims

1. Aqueous preservative, containing ammonium tetraformate or any other combination of formic acid and ammonia, for grass and other agricultural crops, fish and fish products and meat products, having reduced corrosiveness and irritation to skin, comprising 0.5-5 weight% glycerol.
2. Preservative according to claim 1,  
c h a r a c t e r i z e d i n t h a t  
the preservative contains 0.75-1.5 weight% glycerol.
3. Preservative according to claim 1,  
c h a r a c t e r i z e d i n t h a t  
the preservative contains at least one metal corrosion inhibitor and/or antioxidant.
4. Preservative according to claim 1,  
c h a r a c t e r i z e d i n t h a t  
the preservative contains cocobetaine or alkyl glycoside as metal corrosion inhibitor.

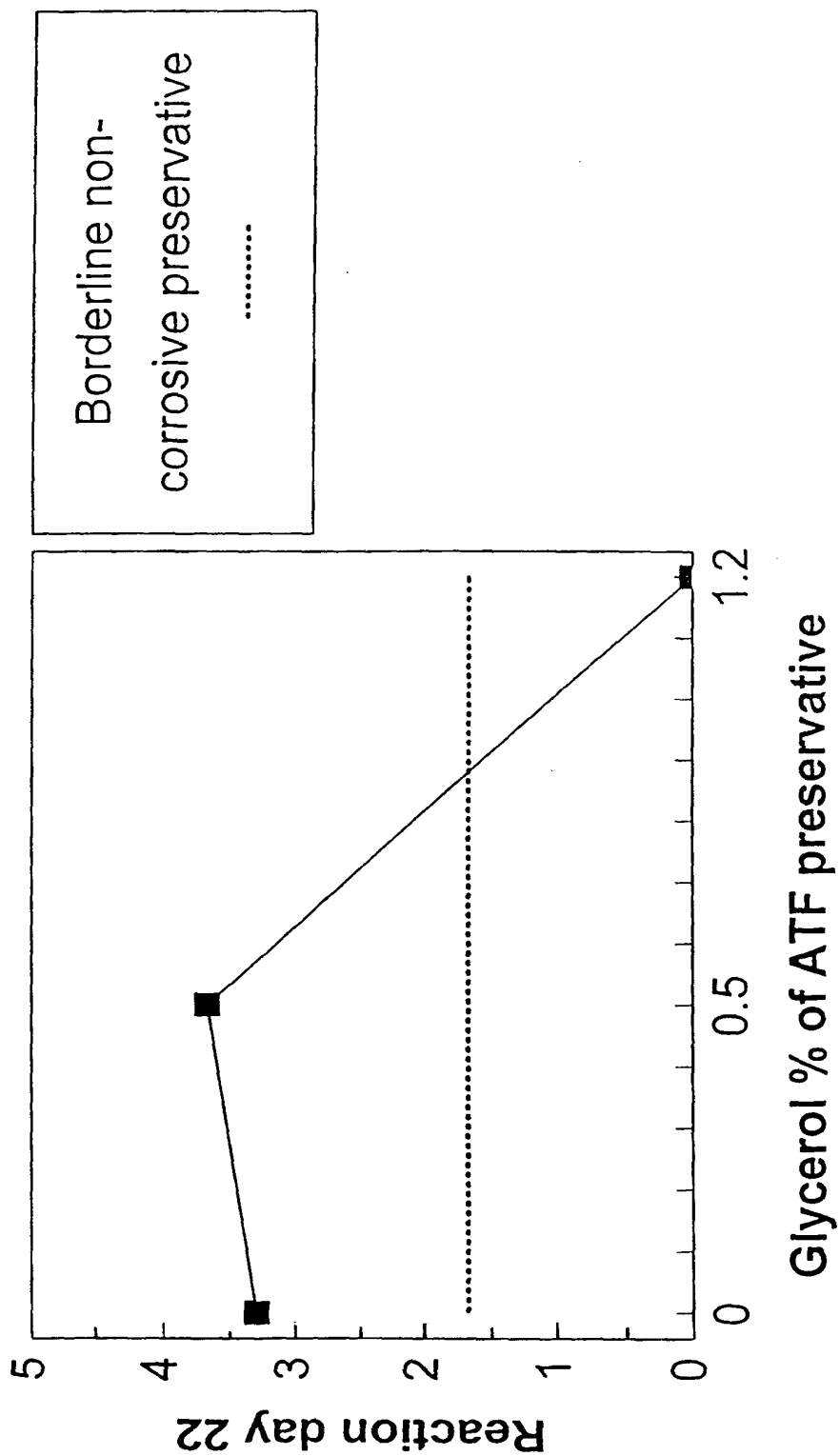
1/2

Figure 1



2/2

Figure 2



## PATENT COOPERATION TREATY

## PCT

## INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference <b>P9859</b>	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No. <b>PCT/NO 99/00244</b>	International filing date ( <i>day/month/year</i> ) <b>28 July 1999</b>	(Earliest) Priority Date ( <i>day/month/year</i> ) <b>14 August 1998</b>
Applicant <b>NORSK HYDRO ASA et al</b>		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 4 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

1. ☐ Certain claims were found unsearchable (See Box I).
2. ☐ Unity of invention is lacking (See Box II).
3. ☐ The international application contains disclosure of a nucleotide and/or amino acid sequence listing and the international search was carried out on the basis of the sequence listing
  - ☐ filed with the international application.
  - ☐ furnished by the applicant separately from the international application,
    - ☐ but not accompanied by a statement to the effect that it did not include matter going beyond the disclosure in the international application as filed.
  - ☐ transcribed by this Authority.
4. With regard to the title, ☒ the text is approved as submitted by the applicant.
  - ☐ the text has been established by this Authority to read as follows:
5. With regard to the abstract,
  - ☐ the text is approved as submitted by the applicant.
  - ☒ the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.
6. The figure of the drawings to be published with the abstract is:
  - Figure No. 2 ☒ as suggested by the applicant. ☐ None of the figures.
  - ☐ because the applicant failed to suggest a figure.
  - ☐ because this figure better characterizes the invention.

## Box III TEXT OF THE ABSTRACT (Continuation of item 5 of the first sheet)

The present invention relates to aqueous preservatives, containing ammonium tetraformate or any other combination of formic acid and ammonia, for grass and other agricultural crops, fish and fish products and meat products, having reduced corrosiveness and irritation to skin, comprising 0.5-5 weight% glycerol. Preferably the content of glycerol in the preservative is 0.75-1.5 weight%. The preservative may further contain at least one metal corrosion inhibitor and/or antioxidant.



## INTERNATIONAL SEARCH REPORT

International application No.

PCT/NO 99/00244

## A. CLASSIFICATION OF SUBJECT MATTER

IPC6: A01N 37/02, A01N 31/02, A23K 3/03, A23B 4/12, A23L 3/3517  
According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: A01N, A23K, A23B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	WO 9912435 A1 (NORSK HYDRO ASA), 18 March 1999 (18.03.99), page 5; page 9, Table 1, Test no. 9 --	1-4
P,A	WO 9900023 A1 (KEMIRA CHEMICALS OY), 7 January 1999 (07.01.99) --	1-4
A	STN International, File CABA, CABA accession no. 86.42464, Document no. 860787067, Westgaard, P.: "Formic acid in a new form"; & Buskap og Avdratt, (1985) Vol. 37, No. 4, pp. 246-247 --	1-4

☒ Further documents are listed in the continuation of Box C.

☒ See patent family annex.

\* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

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"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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Date of the actual completion of the international search

17 November 1999

Date of mailing of the international search report

12 -12- 1999

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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/NO 99/00244

## C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 4220661 A (JOHN J. HUITSON), 2 Sept 1980 (02.09.80), the examples --	1-4
A	EP 0411827 B1 (BP CHEMICALS LIMITED), 15 December 1993 (15.12.93) --	1-4
A	GB 2012169 A (BP CHEMICALS LIMITED), 25 July 1979 (25.07.79) --	1-4
A	STN International, File CAPLUS, CAPLUS accession no. 1989:438263, Document no. 111:38263, Mitsui Toatsu Chemicals, Inc.: "Ammonium tetraformate-containing complete feed compositions and their manufacture"; & JP,A2,01074955, 19890320 -- -----	1-4

INTERNATIONAL SEARCH REPORT  
Information on patent family members

02/11/99

International application No.

PCT/NO 99/00244

Patent document cited in search report			Publication date	Patent family member(s)		Publication date
WO	9912435	A1	18/03/99	AU	9098598 A	29/03/99
				NO	305301 B	10/05/99
				NO	974200 A	12/03/99
-----						
WO	9900023	A1	07/01/99	AU	7919698 A	19/01/99
				FI	972605 A	19/12/98
-----						
US	4220661	A	02/09/80	CA	1066617 A	20/11/79
				DE	2653448 A,C	07/07/77
				FI	61790 B,C	30/06/82
				FI	763155 A	28/05/77
				NL	185703 B,C	01/02/90
				NL	7612828 A	01/06/77
				SE	425455 B,C	04/10/82
				SE	7612196 A	28/05/77
-----						
EP	0411827	B1	15/12/93	SE	0411827 T3	
				AT	98439 T	15/01/94
				AU	622570 B	09/04/92
				AU	5994190 A	31/01/91
				CA	2021973 A	30/01/91
				DE	69005224 D,T	31/03/94
				DK	411827 T	11/04/94
				ES	2062381 T	16/12/94
				FI	903761 D	00/00/00
				IE	64425 B	09/08/95
				JP	2549455 B	30/10/96
				JP	3191756 A	21/08/91
				NO	178251 B,C	13/11/95
				NZ	234670 A	25/10/91
				PL	164652 B	31/08/94
				PT	94824 A,B	20/03/91
				US	5082675 A	21/01/92
-----						
GB	2012169	A	25/07/79	NONE		
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ClaimsREPLACED BY  
ART 34 AMDT


1. Aqueous preservative, containing ammonium tetraformate or any other combination of formic acid and ammonia, for grass and other agricultural crops, fish and fish products and meat products, having reduced corrosiveness and irritation to skin, comprising 0.5-5 weight% glycerol.
2. Preservative according to claim 1,  
c h a r a c t e r i z e d i n t h a t  
the preservative contains 0.75-1.5 weight% glycerol.
3. Preservative according to claim 1,  
c h a r a c t e r i z e d i n t h a t  
the preservative contains at least one metal corrosion inhibitor and/or antioxidant.
4. Preservative according to claim 1,  
c h a r a c t e r i z e d i n t h a t  
the preservative contains cocobetaine or alkyl glycoside as metal corrosion inhibitor.

Kopi til orientering

PCT

## REQUEST

The undersigned requests that the present international application be processed according to the Patent Cooperation Treaty.

For receiving Office use only	
PCT/NO 99/00244	
International Application No.	
International Filing Date 28 JULI 1999 (28.07.99)	
 <b>PATENTSTYRET</b> Styret for det industrielle rettsvern PCT International Application	
Name of receiving Office and PCT International Application	
Applicant's or agent's file reference (if desired) (12 characters maximum) P9859	

<b>Box No. I TITLE OF INVENTION</b>	
"AQUEOUS PRESERVATIVE"	
<b>Box No. II APPLICANT</b>	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)	
NORSK HYDRO ASA N-0240 Oslo Norway	
<input type="checkbox"/> This person is also inventor.	
Telephone No. 47-22432100	
Facsimile No. 47-22432308	
Teleprinter No.	
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St. Hansg. 3  
N-3714 Skien  
Norway

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- ☐ applicant only  
☒ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

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Norway

This person is:

- ☐ applicant only  
☒ applicant and inventor  
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- ☐ applicant only  
☐ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

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This person is:

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☐ applicant and inventor  
☐ inventor only (If this check-box is marked, do not fill in below.)

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Box, No. V DESIGNATION OF STATES

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- ☐ .....
- ☐ .....

**Precautionary Designation Statement:** In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation of a designation consists of the filing of a notice specifying that designation and the payment of the designation and confirmation fees. Confirmation must reach the receiving Office within the 15-month time limit.)

Box No. VI PRIORITY CLAIM		<input type="checkbox"/> Further priority claim indicated in the Supplemental Box.		
Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country	regional application: * regional Office	international application: receiving Office
item (1) 14 Aug 1998 (14.08.98)	19983729	NO		
item (2)				
item (3)				

☒ The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of the present international application is the receiving Office) identified above as item(s): (1)

\* Where the earlier application is an ARIPO application, it is mandatory to indicate in the Supplemental Box at least one country party to the Paris Convention for the Protection of Industrial Property for which that earlier application was filed (Rule 4.10(b)(ii)). See Supplemental Box.

### Box No. VII INTERNATIONAL SEARCHING AUTHORITY

**Choice of International Searching Authority (ISA)**  
(if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):

ISA / SE

**Request to use results of earlier search; reference to that search** (if an earlier search has been carried out by or requested from the International Searching Authority):

Date (day/month/year)

Number

Country (or regional Office)

### Box No. VIII CHECK LIST; LANGUAGE OF FILING

This international application contains the following number of sheets:

request : 4

description (excluding sequence listing part) : 8

claims : 1

abstract : 1

drawings : 2

sequence listing part of description : \_\_\_\_\_

Total number of sheets : 16

This international application is accompanied by the item(s) marked below:

1. ☒ fee calculation sheet
2. ☒ separate signed power of attorney
3. ☐ copy of general power of attorney; reference number, if any:
4. ☐ statement explaining lack of signature
5. ☐ priority document(s) identified in Box No. VI as item(s):
6. ☐ translation of international application into (language):
7. ☐ separate indications concerning deposited microorganism or other biological material
8. ☐ nucleotide and/or amino acid sequence listing in computer readable form
9. ☐ other (specify):

Figure of the drawings which should accompany the abstract: 2

Language of filing of the international application: English

### Box No. IX SIGNATURE OF APPLICANT OR AGENT

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).



Arne Sundnes

For receiving Office use only		2. Drawings:  <input checked="" type="checkbox"/> received:  <input type="checkbox"/> not received:
1. Date of actual receipt of the purported international application:	28 JULI 1999 (28.07.99)	
3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:		
4. Date of timely receipt of the required corrections under PCT Article 11(2):		
5. International Searching Authority (if two or more are competent): ISA / SE	6. <input type="checkbox"/> Transmittal of search copy delayed until search fee is paid.	

For International Bureau use only
Date of receipt of the record copy by the International Bureau: